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Fighting the Future

16 July 2010

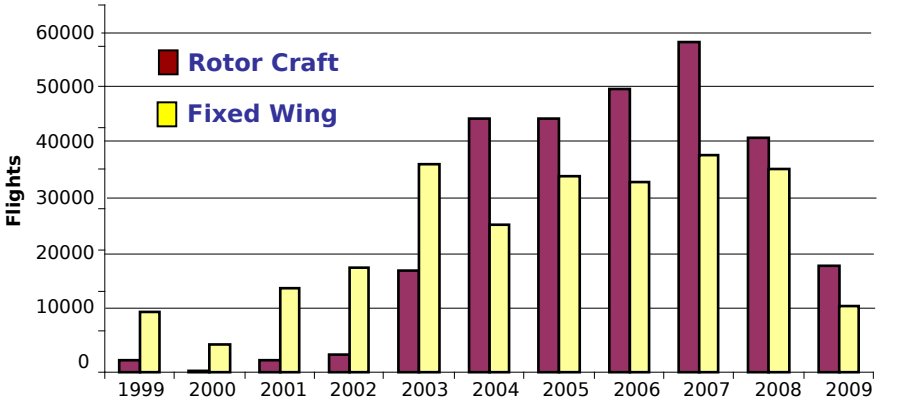
Doug Isleib – NACRA Director

Our rotorcraft forces are:

- **Carrying the fight & engaged globally**
- **Against a committed and persistent threat**
- **In a resource-challenged environment!**

Naval Rotorcraft

Combat/Combat Support/CSAR Flights/Year

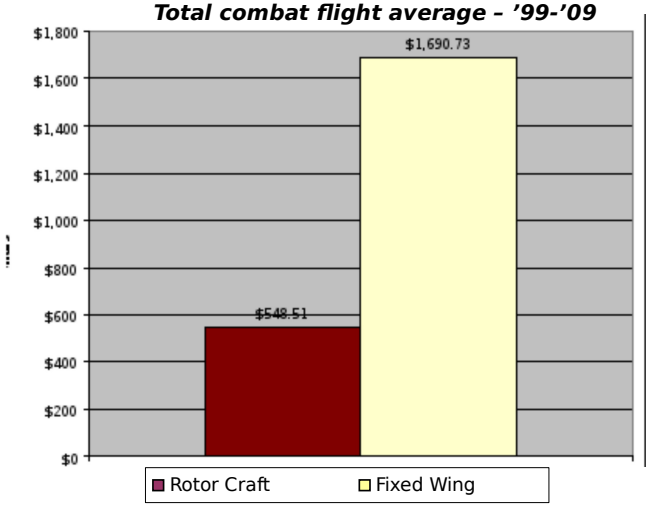


Source – DECKPLATE Database

RC & FW Have roughly equal combat exposure

FY09 S&T Funding per combat flight

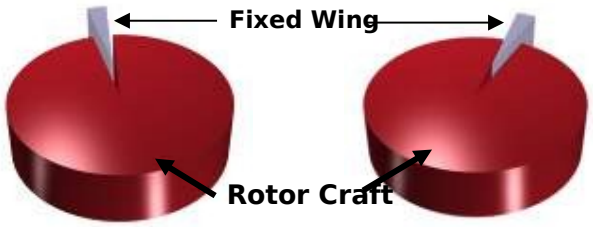
Total combat flight average – '99-'09



FW has 3:1 S&T Funding per combat flight

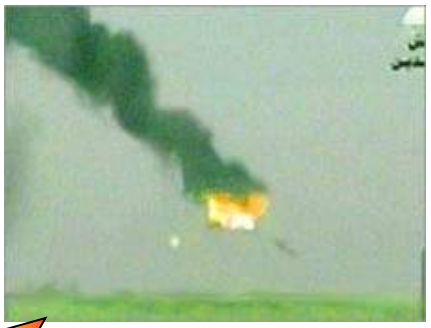
Source – DECKPLATE Database & AT&L (Dr. Kenyon)

GWOT/OCO Combat Losses – Oct '01- May '10



Aircraft Losses
16:1 R/W to TACAIR
390 RC: 13 FW

Fatalities
52:1 R/W to TACAIR
526 fatalities: 7 fatalities



RC suffer 16:1 Losses

Source – Joint Aircraft Survivability Program Study on Rotorcraft Survivability

Funding disparity contributes to higher loss rate for rotorcraft

NACRA charts *and* **aligns** *the rotorcraft community's* **future** *through* **strategic planning** & **technology development**

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1. Align the Rotorcraft Community

- Vertical Lift Strategic Study
- Future Vertical Lift Initiative
- Encourage common vision
- Foster common requirement
- Align Rotorcraft Academia

2. Reduce Total Ownership Costs

- Condition-Based Maintenance

3. Enhance Warfighter Capability & Accelerate Rotorcraft Technology

- Accelerate Technology development
- Roadmapping
- Digital Interoperability
- Safety & Survivability
- Mission Effectiveness
- Workforce development

Agenda

1. Align the Rotorcraft Community

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Strategic Analysis

Vertical Lift Strategic Study

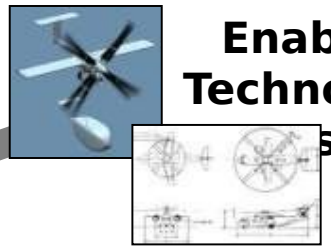
Overview

Doctrine

Resource

Programs & orms

Enabling Technologie s



Benchmarking

Analysis & Surveys

Infrastruct

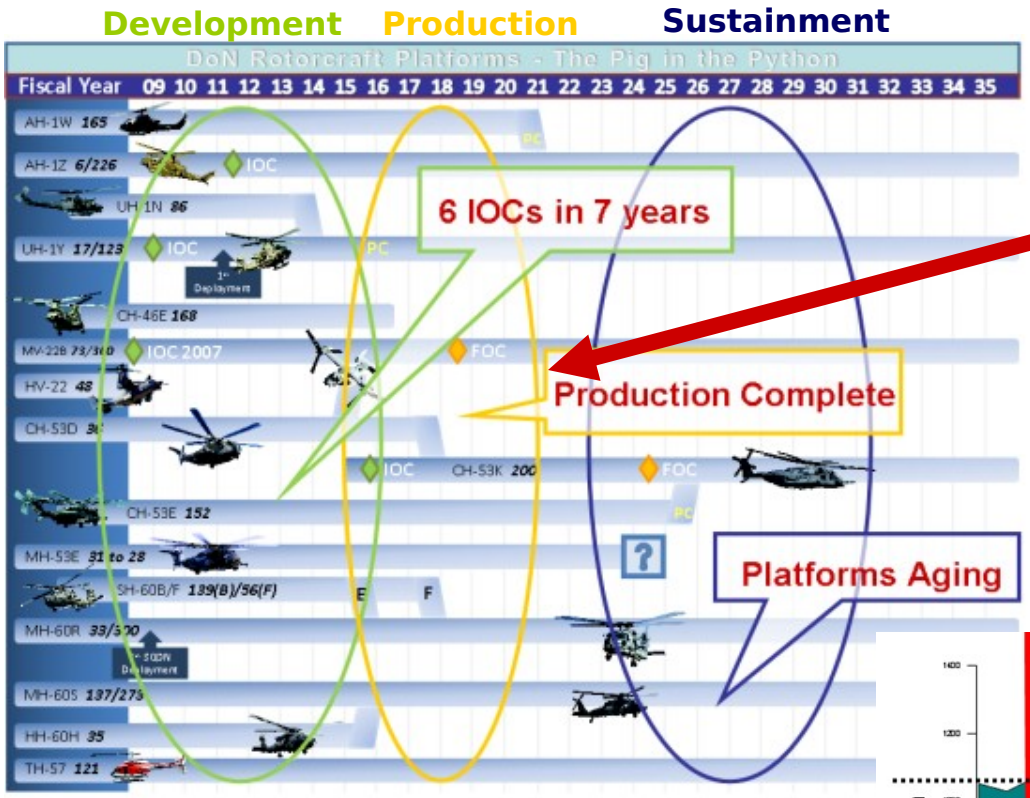
Industr y

Communities & Coalitions

Gap Analysis
- *Findings*
- *Recommendations*

Vertical Lift Strategic Study

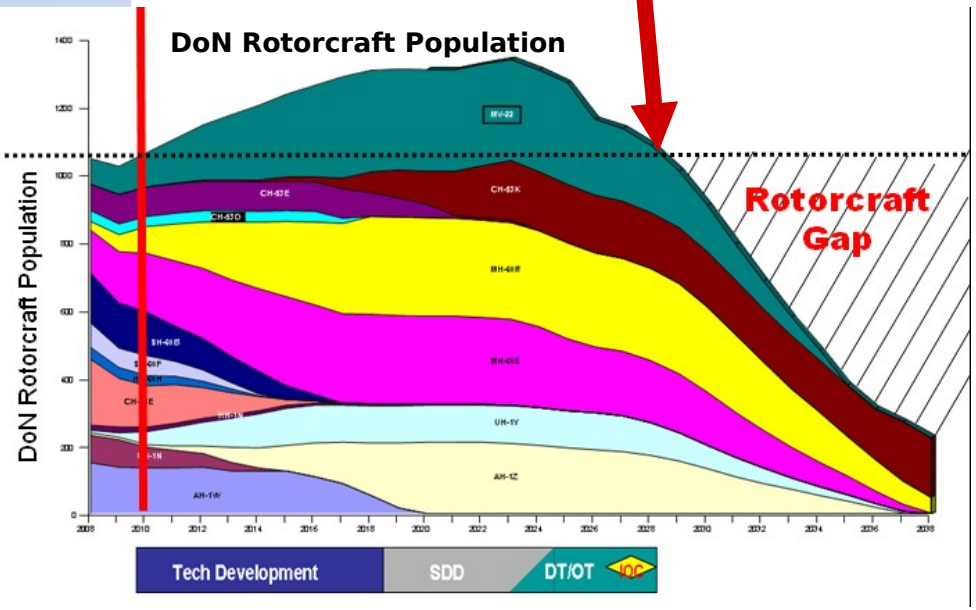
Trends



DoN Rotorcraft Population

Current trends

- 2015-2025 – Shift to sustainment (RDT&E skills atrophy)
- Attrition -- VL "Gap" after 2026



- Delay of phased new program starts created "Millennial Bulge" of bunched new PORs
- Entire fleet now on same lifecycle 'calendar'

Assumptions: 10,000 hr life, usage rate more than WSPD & less than current rates, attrition of 2 a/c per year, data from program offices

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Vertical Lift Bottom Line

"DoD vertical lift capabilities have been a key component of our success in the GWOT."
SecDef

- VL's value in current fight is **undeniable**
- 526 people, 390 rotorcraft **lost since 2001**
- Future force capabilities & attributes ***can not be met by current fleet***
- Current DoD VL S&T funding is ***< .02% of DoD budget*** ($110M/yr)
- **Stagnation** of US industrial base may lead DOD to ***non-US sources*** for future vertical lift development & acquisition
- **W/O adequate funding – No NextGen advanced tech/capabilities**
  - *"No bucks, no Buck Rogers"*

Future Vertical Lift (FVL) Initiative

OSD led, Joint effort

- **FVL Congressional reports**
  - FVL Strategic Plan
  - Capabilities Based Assessment (CBA)
  - Management Plan
  - FVL S&T

- **Vertical Lift Consortium**
  - Govt/Industry participation
  - Goals
    - Enhanced sector-wide cooperation / performance
    - Improved focus and resourcing
    - Agile execution tools

2. Reduce Total Ownership Costs

Condition-Based Maintenence

CBM Definition

Condition-Based Maintenance -- *System of on-board sensors and off-board diagnostics that enable problem detection and maintenance only when needed*

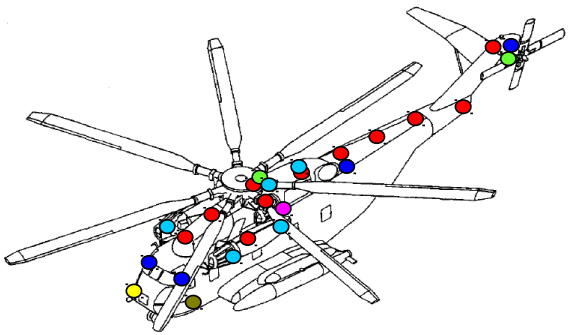
CBM Elements

- On-Board Sensors
- Ground Stations
- Data Management & Analysis

Outcomes

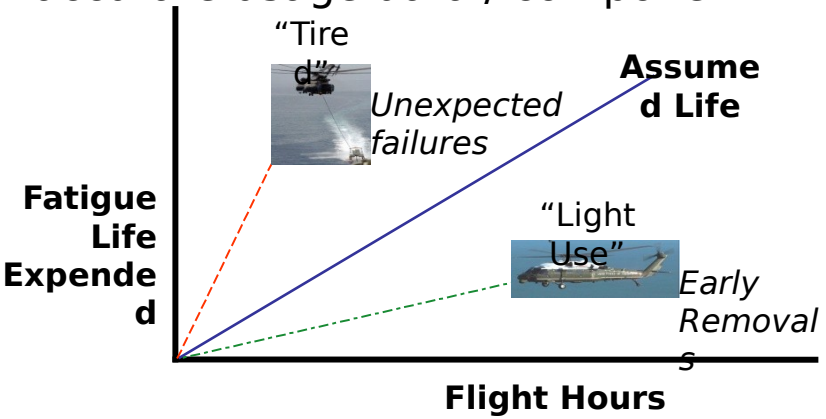
Mechanical Diagnostics

Component condition / "health"



Structural Appraisal of Fatigue Effects (SAFE)

accurate usage data / component "life"



Operations & Maintenance As Is (Current State)

Operations without CBM

1. Unscheduled

- R&R broken components
- Repair broken structure
- Inspection/troubleshooting (Due to symptom)

2. Scheduled

- Removal (High Time)
- Inspection (Preventive)
- Servicing

Benefits

- Fly to failure (no wasted life, but..)
- Safety (due to conservative engineering analysis)

Drawbacks

- Unexpected catastrophic failures
- Unexpected maintenance
- Removal of serviceable components (wasted life)
- Maintenance-induced failures

Operations & Maintenance To Be

Operations with CBM

1. Unscheduled

- R&R / repair of unmonitored systems / components

2. Scheduled

- Preemptive / predictive R&R components
- Inspections (reduced)
- Servicing

Benefits

- Greater safety – critical components monitored
- Maintenance aligned to existing "scheduled" maintenance
- Less unexpected maintenance
- Serviceable components not removed

Drawbacks

- Unmonitored components

Improved safety, readiness, and cost

Condition-Based Maintenance (CBM+)

Goal

- Platform specific sensors and data collection
- Platform agnostic ground station
- Centralized data management and analysis

Key Tenets

- Govt owned
- Common solutions

Execution Plan – Overview

- Develop standardized data transmission architecture
  - *Software development*
  - *IA certification/approval*
- Develop warehouse capability
  - *Hardware and software*
  - *Stores and manipulates data*
- Data analysis to enable
  - *Component health monitoring*
  - *Component "true life"*

Agenda

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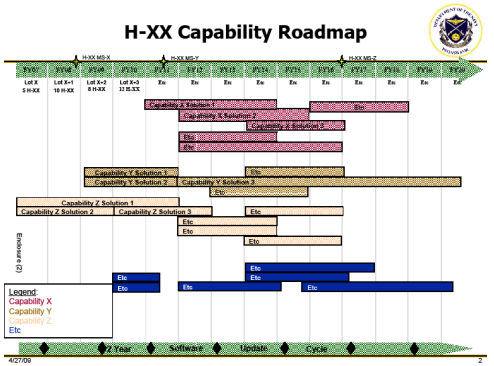
Roadmapping

3. Enhance Warfighter Capability & Accelerate Rotorcraft Technology



Roadmapping

Why?

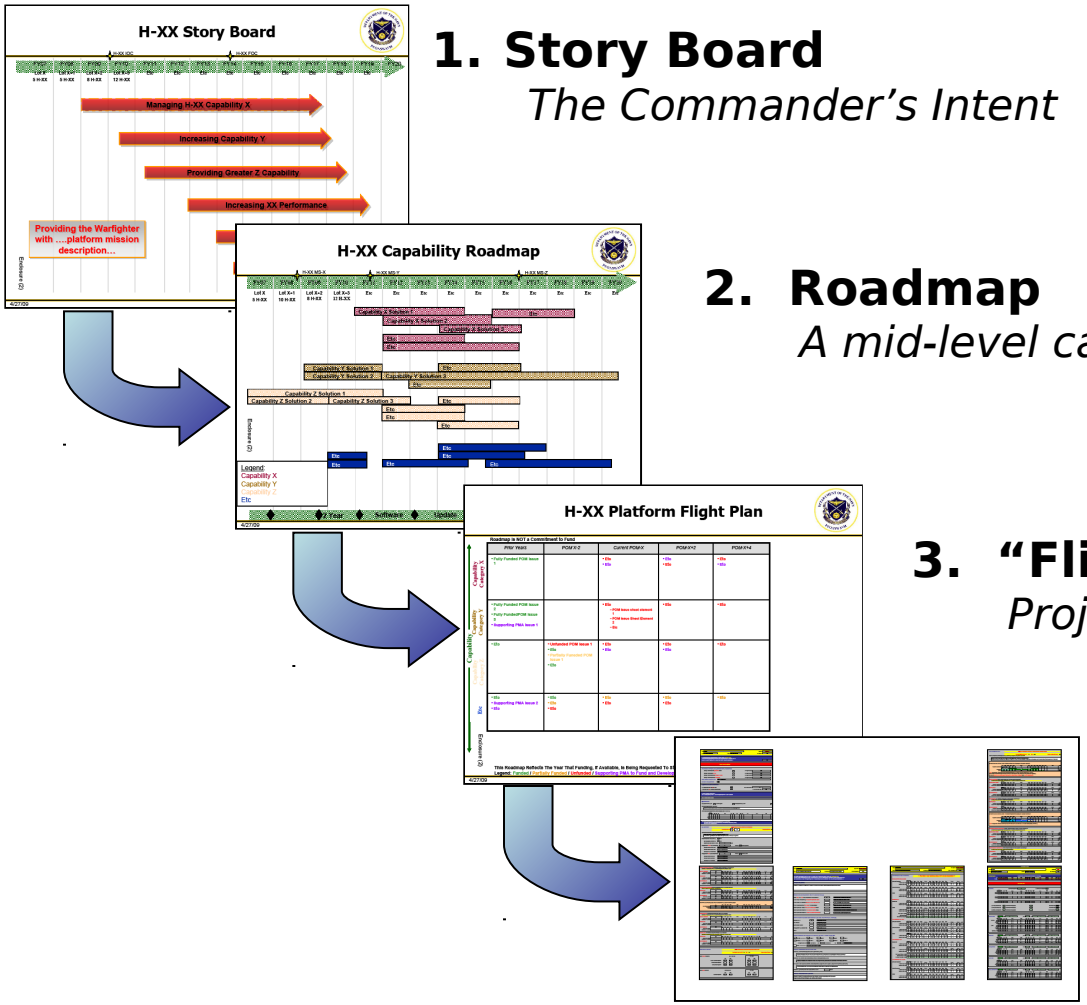
- *Disciplined approach to a fiscally responsible investment plan*
- *Improved communication & trust = **credibility***
- *Community-wide long-range planning & commonality targeting*
- *Influence / focus industry investment*

Key elements

- *Common method & plans across platform PMAs*
- *Integrate commodity program planning*
- *Incorporate S&T timeframe / roadmaps*
- *Inform rotorcraft industry*
- *Expand across service boundaries*

Standard Roadmaps were used for POM 12

Road Map Process



1. Story Board

The Commander's Intent

2. Roadmap

A mid-level capability plan

3. "Flight Plan"

Proj. POM issue sheets by capability ar

4. The Data Sheet

A mid-level capability plan

Total funding compiled & time phased

A defensible Cost & Schedule Position!

NACRA's Process:

- ***Single, unified voice for the VL Community***
- ***A disciplined, fiscally responsible investment plan***
- ***Verifiable, justifiable & repeatable POM/PR Issue Sheet submissions***

Agenda

Test Bed

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3. Enhance Warfighter Capability Accelerate Rotorcraft Technology

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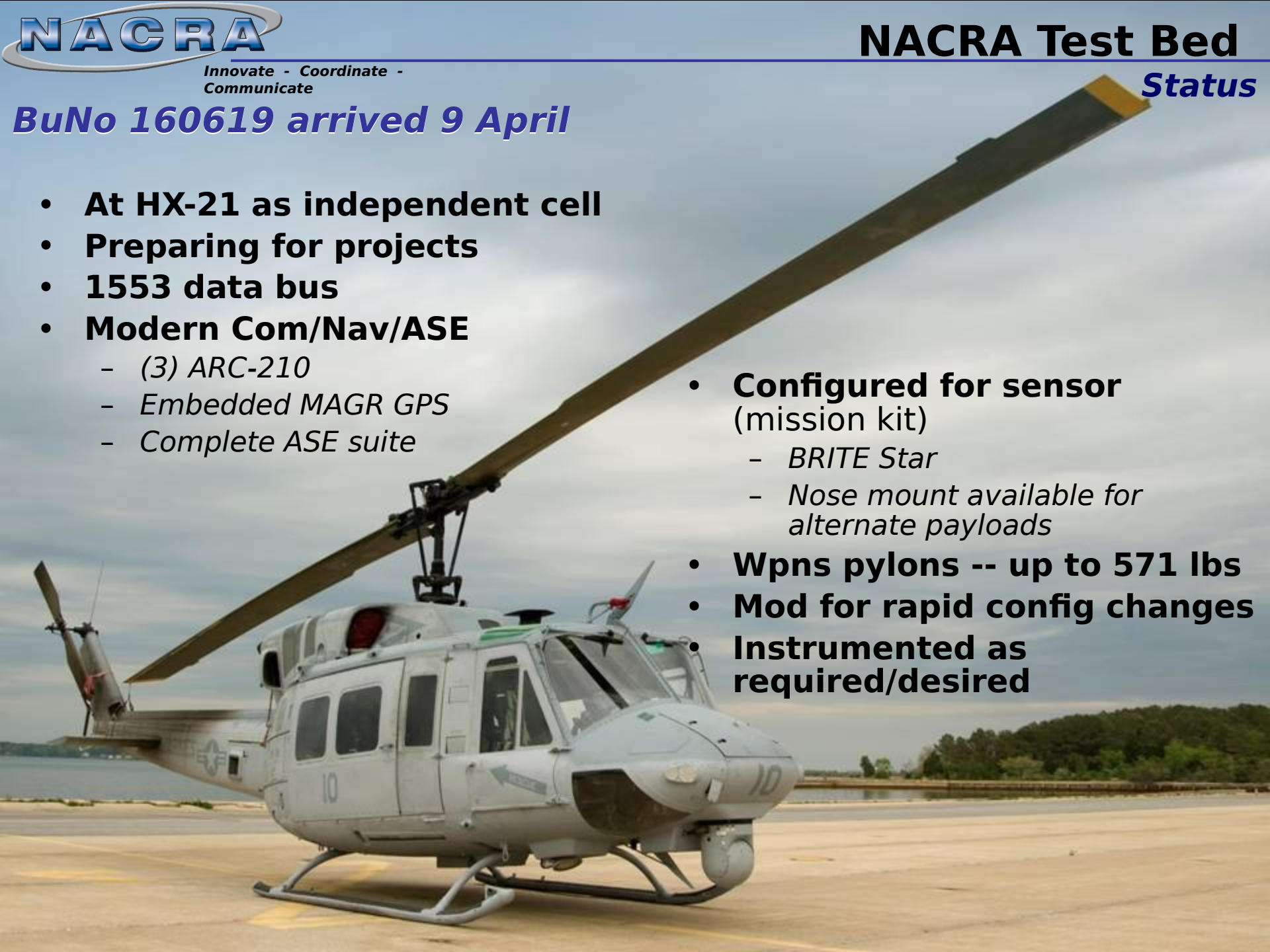
NACRA Test Bed

Status

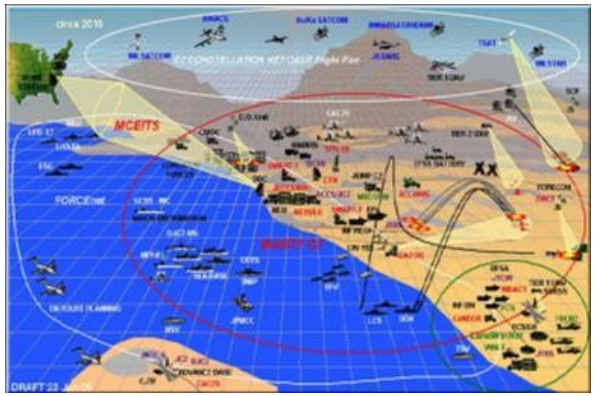
BuNo 160619 arrived 9 April

- **At HX-21 as independent cell**
- **Preparing for projects**
- **1553 data bus**
- **Modern Com/Nav/ASE**
  - *(3) ARC-210*
  - *Embedded MAGR GPS*
  - *Complete ASE suite*



- **Configured for sensor** (mission kit)
  - *BRITE Star*
  - *Nose mount available for alternate payloads*
- **Wpns pylons -- up to 571 lbs**
- **Mod for rapid config changes**
- **Instrumented as required/desired**

Technology Focus Areas



Digital Interoperability

Future Concepts

'We are not fully digital or interoperable… Investing in technology with evolutionary capability will allow us to exploit opportunities and gain dominance in the digital fight.'

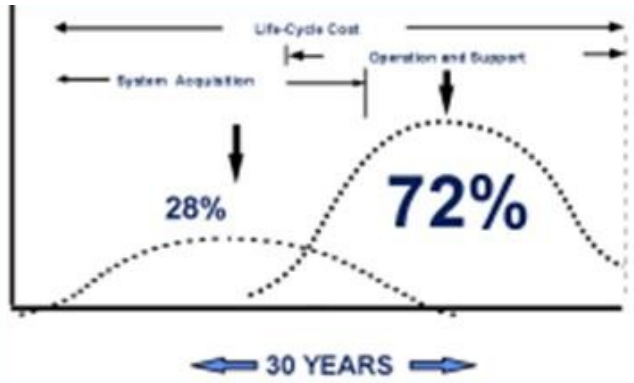
Lt.Gen George Trautman, USMC

Safety

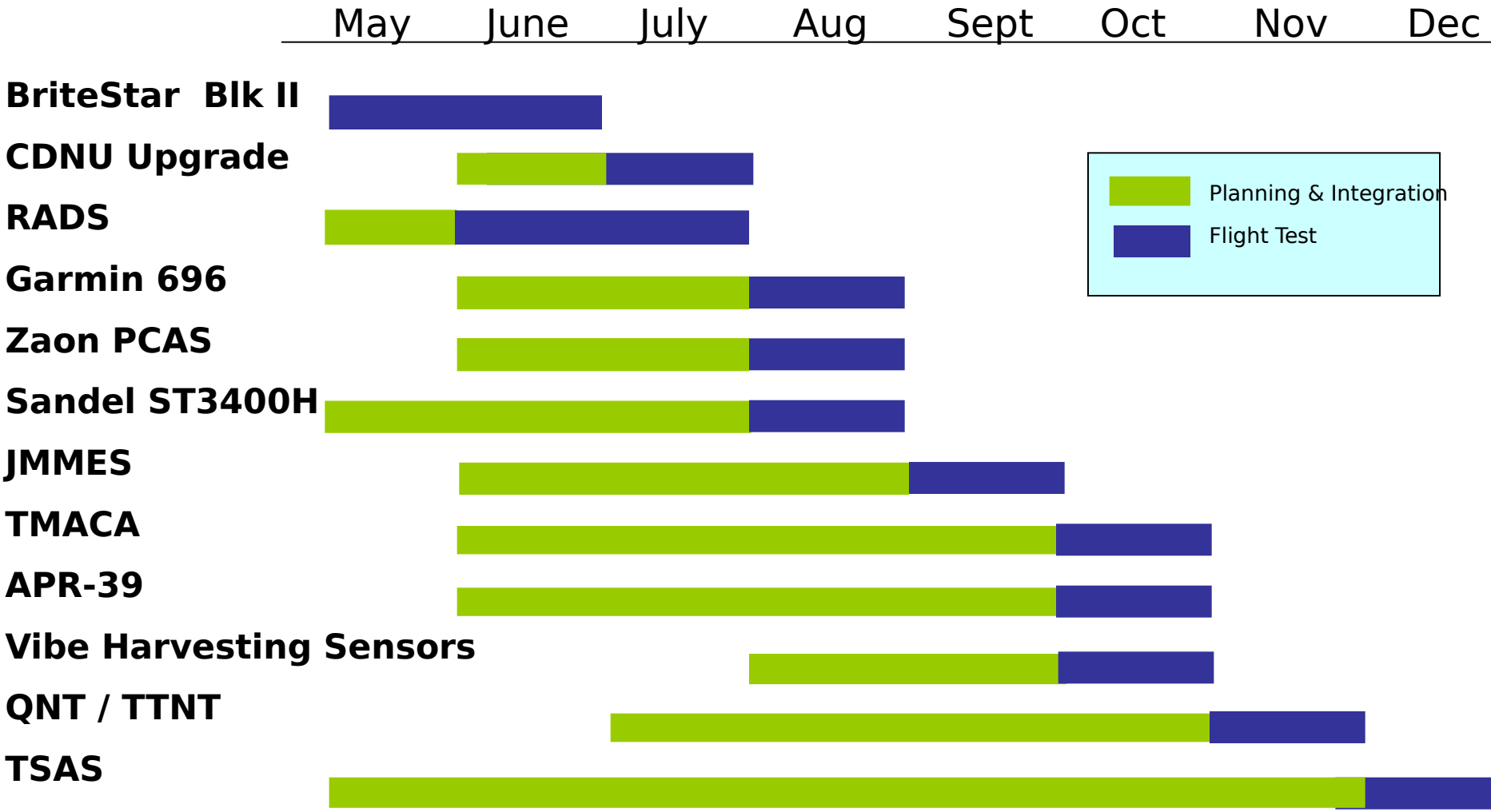
&

Survivability

RTOC



Test Bed Schedule



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